



DEPARTMENT OF THE NAVY
HEADQUARTERS, UNITED STATES MARINE CORPS
WASHINGTON, DC 20380-0001

NORMAL

TI 10340-15/1D
28 September 2001

U.S. MARINE CORPS TECHNICAL INSTRUCTION

FUEL REQUIREMENTS AUTHORIZED FUELS FOR ENGINES

Encl: (1) Table of Marine Corps Diesel Engines-Fuel Compatibility
(2) Table of Fuel Nomenclatures
(3) Fuel Users Guide 2000

1. Purpose. To provide a listing of the various types of fuels to use in diesel (compression ignition) engines, gasoline engines (spark ignition), and (multi fuel-type) engines.

2. Cancellation. TI 10340-15/1C.

3. Background. This Technical Instruction (TI) revises the list of recommended fuels to use in Marine Corps (MC) operating forces equipment. It also shows alternates which may be substituted for the recommended fuel. In addition an emergency fuel is shown for use when none of these are available. This listing is provided to assist units in selecting fuels during shortages.

4. Information and Definitions

a. The primary fuel is that type, grade, octane etc., stated in Commandant Marine Corps (CMC) message R 310101Z May 2000. Department of Defense (DOD) has identified JP-5/8 as the single battlefield fuel for all in theater operations for all diesel engine powered equipment. JP-5/8 is not the fuel recommended by the various engine manufacturers for the best engine performance; but DOD has directed the services to use JP-5/8 as primary and DF-1, DF-2, DFM, and DF-A as alternate.

b. Alternate fuels provide equivalent to better performance with little or no reduction of equipment performance or service life. The Alternate I fuel is always preferred over the listed Alternate II.

NOTE

The Commander will decide when it is necessary to perform an assigned mission using emergency fuel.

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c. Emergency fuels will operate the equipment with a significant decrease in performance. Increased maintenance is necessary, and engine life is reduced. Extended use will cause engine damage or failure. Therefore, emergency fuels will be used only in combat situations when primary or alternate fuels are not available. Emergency fuel must not be used any longer than absolutely necessary, and all maintenance functions must be in accordance with the technical manual.

5. Basic Fuel Requirement Policy

a. Enclosure (1) is a tabulation of the various types of fuel suitable for use in MC compression ignition engines. Enclosure (2) is tabulation of pertinent North Atlantic Treaty Organization (NATO) equipment type fuels which may be substituted for the listed United States of America (USA) types. Enclosure (3) is abstracted from Army Regulation AR70-12 and is a guide for fuel users.

b. Marine Corps equipment includes a considerable variety of gasoline engines. The Motor Gasoline (MOGAS) MIL-G-3056, is applicable to all gasoline engines except aircraft.

6. Action. Units will use this TI to select the appropriate fuel for the various conditions covered. Recommended fuels will be used whenever available. If the recommended fuel is not available then the alternate fuels must be used for essential mission performance.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL



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DISTRIBUTION: PCN 168 100160 00

TABLE OF U.S. MARINE CORPS ENGINES-FUEL COMPATIBILITY

Fuel Compatibility for Engineer, Motor Transport, and Ordnance-Tracked Vehicles

TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1 /	Alternate Fuel	Emergency Fuel	Remarks
B0055	BATH/ SHOWER Unit	VY-7-8DD	York Shipley	JP-5/8	DF-2		
B0060	BATH UNIT			MOGAS	None	MOGAS	
B0114	BOAT, Bridge MK-2	Diesel	MIC Industries	JP-5/8	DF-1		
B0355	DITCHING MACHINE	Diesel	Duetz	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	
B0390	COMPRESSOR, Air, Rotary, 250 CFM	4-53	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	<u>2</u>
B0395	COMPRESSOR, Air, Rotary, 250 CFM	4-53	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	<u>2</u>
B0391	CONTAINER HANDLER	3408T	Caterpillar	JP-5/8	DF-1, DF-2 DFM	JP-4	
B0443	HSHM CRANE, 25 Ton	3208	Caterpillar	JP-5/8	DF-1, DF-2 DFM	JP-4	
B0446	CRANE, 7 ½ Ton Koehring	4B3.9	Cummins	JP-5/8	DF-1, DF-2	JP-4	

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TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/ Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
B0589	ARMORED COMBAT EARTH MOVER, M9	V903C	Cummins	JP-5/8	DF-1, DF-2	JP-4	
B0591	EXCAVATOR, 1085C J. I. Case	6T590	Case	JP-5/8	DF-1, DF-2	DFM, JP-4	
B0675	FUEL DISPENSING, System Tactical	3-53	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	2
B0685	FUEL SYSTEM, Amphibious, Assault, Model M69HC (600 GPM Pump)	3-53	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	2
B1082	GRADER, ROAD, Motorized	3304	Caterpillar	JP-5/8	DF-1, DF-2 DFM	JP-4	
B1135	REFUELER SYSTEM Helicopter Expedient	Diesel	Duett/ Yanmar	JP-5/8	DF-1, DF-2 DFM	JP-4	
B1226	LAUNDRY UNIT	VY-7-8DD	York Shipley	JP-5/8	DF-2	DFM	
B1291	DECONTAMINATION KIT, MK17 Lightweight	215cc HFE		JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	
B1326	MIXER, Concrete	TR1	Lister Petter	JP-5/8	DF-1, DF-2 DFM	DFM	

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TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1 /	Alternate Fuel	Emergency Fuel	Remarks
B1570	REFUELING SYSTEM, Expedient	Diesel	Hatz/Yanmar	JP-5/8 DF-A, DF-1, DF-2		DFM, JP-4	<u>2</u>
B1580	SIXCON, Fuel Pump Module	EG73LHR-241	Hatz	JP-5/8 DF-A, DF-1, DF-2		DFM, JP-4	<u>2</u>
B1581	SIXCON, Water Pump Module	Diesel	Hatz	JP-5/8 DF-A, DF-1, DF-2		DFM,JP-4	
B1582	PUMP, Water 350 GPM	Diesel	Deutz Diesel	JP-5/8 DF-A, DF-1, DF-2		DFM, JP-4	<u>2</u>
B1620	125 GPM PUMP SET	Diesel	Hatz	JP-5/8 DF-A,DF-1 DF-2		DFM, JP-4	
B1780	RIVERINE ASSAULT CRAFT	Diesel	Cummins	JP-5/8 DF-A,DF-1 DF-2		DFM, JP-4	
B1785	COMPACTOR, Roller 563D	3126	Caterpillar	JP-5/8 DF-1,DF-2 DFM		JP-4	
B1922	TRACTOR, Scraper	3306	Caterpillar	JP-5/8 DF-1,DF-2 DFM		JP-4	
B2127	SWEEPER, Runway	7.3LD	International	JP-5/8 DF-1, DF-2		JP-4	

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Fuel Compatibility for Engineer, Motor Transport, and Ordnance-Tracked Vehicles

TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
B2394	PUMP, WATER 600 GPM		Deutz Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	<u>2</u>
B2460	TRACTOR, Full-Tracked	6T 590	Case	JP-5/8	DF-1, DF-2	DFM, JP-4	
B2462	TRACTOR, Full-Tracked D7G	3306	Caterpillar	JP-5/8	DF-1, DF-2 DFM	JP-4	
B2464	BUCKET LOADER, Tracked	6T 590	Case	JP-5/8	DF-1, DF-2	DFM, JP-4	
B2482	S.E.E. TRACTOR	OM 352	Daimler-Benz	JP-5/8	DF-1, DF-2	JP-4	
B2561	TRUCK, Forklift EBFL	6259T	John Deere	JP-5/8	DF-1, DF-2 DFM	JP-4	
B2566	TRUCK, Forklift LCRT	704-30T	Perkins	JP-5/8	DF-1, DF-2 DFM	JP-4	
B2567	BUCKET LOADER, Scoop (TRAM)	7.636L	John Deere	JP-5/8	DF-1, DF-2 DFM	JP-4	
B2628	Medium Fresh Water PURIFICATION UNIT	Diesel	Farymann	JP-5/8	DF-1, DF-2 DFM	JP-4	
B2641	WATER CHILLER, Small Mobile	Diesel	Yanmar	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	<u>2</u>

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TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/ Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
B2685	WELDING MACHINE	LD70047	Perkins	JP-5/8	DF-A, DF-1, DFM	DFM, JP-4	
C2282	DECON SYSTEM NBC	Diesel		JP-5/8	DF-A, DF-1, DFM	DFM, JP-4	
U3031	COMPRESSOR, Air, Rotary, 600 CFM	6-71	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	<u>2</u>
U3020	BUILDING MACHINE, Ultimate	MIC-120	MIC Industries	JP-5/8	DF-1		
U3021	BUILDING MACHINE, Ultimate	MIC-2	MIC Industries	JP-5/8	DF-1		
U3085	DISTRIBUTOR, Bituminous, 800-Gal	LDS 465-1	Continental	JP-5/8	DF-A, DF-1 DF-2, DFM JP-4, JET-A, JET-A1	MOGAS	<u>2</u> Multi-Fuel Engine
Various	MEP, Generator Sets			JP-5/8	DF-A, DF-1 DF-2	DFM	<u>2</u>
Various	TQG GENERATOR Sets	Diesel	Onan Caterpillar	JP-5/8	DF-A, DF-1 DF-2	DFM	<u>2</u>

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TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/ Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
B1960	SHOP EQUIPMNT, Organizational Repair, Light, Truck-Mtd, Set. No. 2	LDS 465-1	Continental	JP-5/8	DF-A, DF-1 DF-2,DFM JP-4, JET-A, JET-A1	MOGAS	<u>2</u> Multi-Fuel Engine
U3170	MIXER, Rotary Tiller	4-71	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM, JP-4	<u>2</u>
D0200	MOTOR CYCLE, KLR250	KL250DE	Kawasaki	MOGAS			
D0209	POWER UNIT, Front, 12 1/2 T, MK 48	8V 92	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM,	<u>2</u>
D0215	SEMITRAILER, Tank	DJC-MS12315T 5000 Gal. M970	Onan	JP-5/8	DF-A, DF-1, DF-2	DFM,	<u>2</u>
D1001	TRUCK, HMMWV, 1 1/4 T (Various)	6.2	GM Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM,	<u>2/3</u>
D1002							
D1125							
D1158							
D1159							
D1123	TRUCK, HMMWV, 1 1/4 T (Various) (Heavy)	6.2	GM Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM,	<u>2/3</u>
D0187							
D1180							
D1160	FAST ATTACK VEHICLE	2.9	Mercedes	JP-5/8	DF-A, DF-1, DF-2	DFM,	

TABLE OF U.S. MARINE CORPS ENGINES-FUEL COMPATIBILITY

Fuel Compatibility for Engineer, Motor Transport, and Ordnance-Tracked Vehicles

TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/ Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
D1059	TRUCK, 5T, M809 Series (Various)	NHC-250	Cummins	JP-5/8	DF-A, DF-1, DF-2, DFM	JP-4	<u>2</u> / <u>3</u> / <u>4</u>
D1061							
D1072							
D1134							
D1212							
D0198	TRUCK, 7T, Series (MTVR)	C-12	Caterpillar	JP-5/8	DFA, DF-1, DF-2, DFM	JP-4	<u>2</u> / <u>3</u> / <u>4</u>
D1062							
D1073							
D1213							
D1059	TRUCK, 5T, M939 Series (Various)	NHC-250	Cummins	JP-5/8	DFA, DF-1, DF-2, DFM	JP-4	<u>2</u> / <u>3</u> / <u>4</u>
D1061							
D1072							
D1134							
D1212							
D1028	TRUCK, Fire Fighting CUCV	6.2	GM Diesel	JP-5/8	DF-A, DF-1, DF-2	DFM,	<u>2</u>
D1064	TRUCK, Crash/Fire/ Rescue, A/S32P-19A	NTC-400	Cummins	JP-5/8	DF-A, DF-1, DF-2, DFM	JP-4	<u>2</u> / <u>3</u> / <u>4</u>
D1092	TRUCK, Maint/Tele/ Utility, M876	NHC250	Cummins	JP-5/8	DF-1, DF-2, DF-A	JP-4	<u>2</u> / <u>3</u> / <u>4</u>

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Fuel Compatibility for Engineer, Motor Transport, and Ordnance-Tracked Vehicles

TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/ Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
E0796	ASSAULT AMPHIBIOUS VEHICLE, Command AAVC7A1	VT400	Cummins	JP-5/8	DF-A, DF-1, DF-2	DFM,	2
E0846	ASSAULT AMPHIBIOUS VEHICLE, Personnel AA VP7A1	VT400	Cummins	JP-5/8	DF-A, DF-1, DF-2	DFM,	2
E0856	ASSAULT AMPHIBIOUS VEHICLE, Recovery AAVR7A1	VT400	Cummins	JP-5/8	DF-A, DF-1, DF-2	DFM,	
E	ADVANCED AMPHIBIOUS ASSAULT VEHICLE AAAV	MT883	MTU	JP-5/8	DF-A, DF-1, DF-2	DFM,	
E0942	LIGHT ARMORED VEHICLE (LAV) (AT)	6V-53T	Detroit Diesel	JP5/8	DF-A, DF-1, DF-2,	DFM, JP-4	2

TABLE OF U.S. MARINE CORPS ENGINES-FUEL COMPATIBILITY

Fuel Compatibility for Engineer, Motor Transport, and Ordnance-Tracked Vehicles

TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/ Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
E0946	LIGHT ARMORED VEHICLE (LAV) (COMM)	6V-53T	Detroit Diesel	JP/5/8	DF-A, DF-1, DF-2,	DFM, JP-4	<u>2</u>
E0947	LIGHT ARMORED VEHICLE (LAV) (LAV-25)	6V-53T	Detroit Diesel	JP/5/8	DF-A, DF-1, DF-2,	DFM, JP-4	<u>2</u>
E0948	LIGHT ARMORED VEHICLE (LAV) (LOG)	6V-53T	Detroit Diesel	JP/5/8	DF-A, DF-1, F-2,	DFM, JP-4	<u>2</u>
E0949	LIGHT ARMORED VEHICLE (LAV) (MORTAR)	6V-53T	Detroit Diesel	JP/5/8	DF-A, DF-1, DF-2,	DFM, JP-4	<u>2</u>
E0950	LIGHT ARMORED VEHICLE (LAV) (COMM)	6V-53T	Detroit Diesel	JP/5/8	DF-A, DF-1, DF-2,	DFM, JP-4	<u>2</u>
E0940	LIGHT ARMORED VEHICLE (LAV) (AD)	6V-53T	Detroit Diesel	JP/5/8	DF-A, DF-1, DF-2,	DFM, JP-4	<u>2</u>

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TABLE OF U.S. MARINE CORPS ENGINES-FUEL COMPATIBILITY

Fuel Compatibility for Engineer, Motor Transport, and Ordnance-Tracked Vehicles

TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
A0966	LIGHT ARMORED VEHICLE (LAV) (MEWSS)	6V-53T	Detroit Diesel	JP-5/8	DF-A, DF-1, DF-2,	DFM, JP-4	<u>2</u>
E1377	RECOVERY VEHICLE, M88A1	AVDS-1790-2DR	General Dynamics Land System (GDLS)	JP-5/8	DF-A, DF-1, DF-2	DFM	<u>2/2</u>
E1378	RECOVERY VEHICLE, M88A2	AVDS-1790-8CR	GDLS	JP-5/8	DF-A, DF-1, DF-2	DFM	<u>2/2</u>
E0150	AVLB, BRIDGE Launcher, M60AI	AVDS-1790-2DA	GDLS	JP-5/8	DF-A, DF-1, DF-2	DFM	<u>2/2</u>
E1888	TANK, M1A1	AGT1500	Allied	JP-5/8	DF-A, DF-1, DF-2	DFM	<u>2/2</u>

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TAM No.	Item Description	Type	Engine Mfr.	Primary Fuel 1/	Alternate Fuel	Emergency Fuel	Remarks
1/	DF-A temperature below -25°F (-31.7° C), DF1 temperature -25F (-31.7° C), to +25°F (3.890 C), DF-2 temperature above +25°F (3.890 C). Applies to all diesel and multifuel engines listed.						
2/	DFM acceptable as an alternate fuel for four cycle engines if sulphur content is 1.0 percent or less; except DFM (regardless of sulphur content) shall be used only as an emergency fuel for the M1A1 Tank, AVL-B, M88A1, and M88A2 Tank Retrievers. DEN with a sulphur content above 0.7 percent shall be used as an emergency fuel. The use will result in need for oil samples to be taken every 15 hours of operation. Units should note in remarks of oil analysis request that "acid is suspected" to ensure acid test on these samples. This applies to DFM with sulphur content that exceeds 1.0 percent used in four cycle engines and 0.7 percent used in two cycle engines (by weight).						
3/	Applies to TAM No's D1001, D1002, D1125, D1158, D1159, D1180.						
4/	Applies to TAM No's D1059, D1061, D1064, D1072, D1134, D1212.						

NOTE

Jet A-1/ F-35 or Jet A is acceptable substitute for JP-5/8 for use in cold to moderate temperature environments.

For moderate to high temperature environments, Jet A-1, F-35 or Jet A are not recommended for continuous

Use with engines fitted with fuel-lubricated rotary injection pumps and should be replaced with JP-5/8/ F-34.

Enclosure (1)

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TABLE OF FUEL NOMENCLATURES

Gasoline Types

<u>Fuel Type</u>	<u>Grade</u>	<u>Specification</u>	<u>NATO No.</u>	<u>Remarks</u>
GASOLINE, Automotive, Combat (MOGAS)	86/95	ASTM-D4814	F-67	Type I-all Purpose
GASOLINE, Automotive, Combat (MOGAS)	86/95	ASTM-D4814	F-67	Type II-all Purpose low-temperature all purpose
GASOLINE, Automotive, Combat	(91 RON)		F-46	NATO combat gas
GASOLINE, Aviation (AVGAS)	80/70	ASTM-D910	F-12	Red dye
GASOLINE, Aviation (AVGAS)	100/130	ASTM-D910	F-18	Green dye
GASOLINE, Aviation (AVGAS)	115/145	ASTM-D910	F-22	Purple dye
GASOLINE, Automotive	Regular	ASTM-D439	None	Octane ratings between 82/92 and 82/94
GASOLINE, Automotive	Premium	ASTM-D439	None	Octane ratings between 91/99 and 90/96
GASOLINE, Automotive, Low- Lead or Unleaded	Special	ASTM-D439	None	Octane ratings between 80/88 and 83/91
GASOLINE, Automotive, Low- Lead or Unleaded	Regular	ASTM-D439	None	Octane ratings between 82/90 and 85/93
GASOLINE, Automotive, Low- Lead or Unleaded	Premium	ASTM-D439	None	Octane ratings between 89/97 and 90/100

Enclosure (2)

TABLE OF FUEL NOMENCLATURES

<u>Diesel / Turbine Types</u>				
<u>Fuel Type</u>	<u>Grade</u>	<u>Specification</u>	<u>NATO No.</u>	<u>Remarks</u>
FUEL OIL, Diesel	DF-A	A-A-52557	F-56	Artic grade
FUEL OIL, Diesel	DF-1	A-A-52557	None	Winter grade
FUEL OIL, Diesel	DF-2	A-A-52557	None	Regular grade
DIESEL FUEL, Regular		A-A-52557	F-54	Similar to and acceptable for DF-2
FUEL OIL, Diesel, Marine	DFM	MIL-F-16884	F-76	Primary fuel for shipboard power- plants
TURBINE FUEL, Aviation	JP-4	MIL-T-5624	F-40	Wide cut, gasoline type
TURBINE FUEL, Aviation	JP-5	MIL-T-5624	F-44	High flash point, Kerosene type
TURBINE FUEL, Aviation	JP-8	MIL-T-83133	F-34	High flash point, Kerosene type
AVIATION TURBINE JET-A FUEL		ASTM-1655	None	Commercial aviation fuel, Regular type
AVIATION TURBINE JET-A1 FUEL		ASTM-1655	None	Commercial aviation fuel, low freeze point
AVIATION TURBINE JET-B FUEL		ASTM-1655	None	Commercial aviation fuel. Same as JP-4 without fuel system icing inhibitor

Enclosure (2)

FUEL USERS GUIDE*

—2000—

Provides:

- **Fuel Definitions**
- **NATO Fuel Designation and U.S. Equivalent Specifications/Standards FUEL**

FUEL DEFINITIONS

Primary Fuel - A fuel that permits full design performance.

Alternate Fuel - A fuel that provides acceptable operational performance versus the Primary fuel, but may be a restricted item of supply in tactical areas or has environmental limitations. Performance shall not degrade below the vehicle/equipment minimum specification requirements. No degradation in reliability or durability will occur.

Emergency Fuel - A fuel used only when the Primary or Alternate fuel is not available. The use of an Emergency fuel shall not materially degrade the design operating life of the vehicle/equipment. Severe performance degradation is permissible when an Emergency fuel is used.

Referee Fuel - A fuel that fully conforms to all requirements within its parent specification but is so designed to maximize selected chemical and physical characteristics, resulting in a fuel that represents the lowest quality level procurable. Referee fuels are not intended for normal service use but are required in research, development, and materiel acquisition programs. These referee fuels are further described in fuel specification MIL-F-46 162.

Alternative Fuel - A general term for any fuel other than conventionally refined gasoline and diesel fuel found in the commercial marketplace.

Acceptable Operational Performance - The level of performance that meets the minimum requirements as defined in the vehicle/equipment specification.

• Abstracted from AR 70-12, Fuels and Lubricants Standardization Policy for Equipment Design, Operation, and Logistic Support, 1 May 1997.

Fuels Used in Army Materiel

Item	Primary Fuel	Alternate Fuel (See Note 1)	Emergency Fuel
<u>Ground gasoline-consuming materiel:</u>			
OCONUS environments	ASTM D 4814 (S-I Fuel) (See Note 2)	F-57 (Gasoline) F-67 (Gasoline) F-18 (AVGAS)	---
CONUS environments	ASTM D 4814 (S-I Fuel)	A-A-52530 (Gasohol) ASTM D 910 (100LL)	---
<u>Ground diesel-consuming materiel:</u>			
OCONUS environments	A-A-52557 (Diesel) (See Note 3)	MIL-DTL-83133 (JP-8), F-34 MIL-DTL-5624 (JP-5), F-44 MIL-F-16884, F-76* F-75 (Navy Distillate) ASTM D 1655 (Jet A-1), (See Note 4) F-65 (Diesel Blend) F-63 (Diesel Fuel)	ASTM D 4814 (S-I Fuel) F-57 (Gasoline) F-67 (Gasoline) F-18 (AVGAS) MIL-DTL-5624 (JP-4), F-40
CONUS environments	A-A-52557 (Diesel)	ASTM D 975 (Diesel) ASTM D 1655 (Jet A/Jet A-1) (See Note 4)	ASTM D 4814 (S-I Fuel) ASTM D 910 (100 LL) ASTM D 1655 (Jet B)
<u>Aviation materiel:</u>			
<u>Gasoline-consuming</u>	ASTM D 910 (100LL)	F-18 (AVGAS)	ASTM D 4814 (S-I Fuel)
<u>Turbine-consuming</u>	MIL-DTL-83133 (JP-8), F-34	MIL-DTL-5624 (JP-5), F-44 MIL-DTL-5624 (JP-4), F-40 ASTM D 1655 (Jet A/A-1) ASTM D 1655 (Jet B)	(See Note 5)

Notes:

- Environmental conditions may limit use of certain alternate fuels designated with an asterisk (*)
- ASTM D 4814 is a spark-ignition engine fuel (S-I fuel) that allows use of oxygenates for reducing CO exhaust emissions.
- Although A-A-52557 is shown as the primary fuel, MIL-DTL-83133 (JP-8) or MIL-DTL-5624 (JP-5) will be used as the primary fuel in those theaters where the Single Fuel on the Battlefield is implemented in accordance with DOD Directive 4140.25 and U.S. ratification of STANAG 4362.
- Jet A-1/F-35 or Jet A is acceptable for continuous use in cold to moderate temperature environments. For moderate to high temperature environments, Jet A-1, F-35, or Jet A are not recommended for continuous use with engines fitted with fuel-lubricated rotary injection pumps and should be replaced with JP-8/F-34.
- Refer to applicable aircraft Operator's Manual.

NATO Fuel Designations and U.S. Equivalent Specification/Standards

NATO Code No.	NATO Title	Military/Federal Specification	Industry Equivalent Standard
F-18	Gasoline, Aviation, Grade 100/130	---	---
--	--	--	ASTM D 910 (100 LL), Aviation Gasoline
F-57	Gasoline, Auto, Low lead (96 RON)	STANAG* 7090	---
F-67	Gasoline, Auto, Unleaded (95 RON)	STANAG 7090	CEN EN 228
--	--	ASTM D 4814 S-I* Engine Fuel	ASTM D 4814 S-I Engine Fuel
--	--	A-A*-52530 Gasohol	ASTM D 4814 S-I Engine Fuel
F-40	Turbine Fuel, Aviation, Widecut Type + FSII (S-1745)	MIL-DTL-5624 Turbine Fuel, Aviation, Grade JP-4	ASTM D 1655 Aviation Turbine Fuel, Jet B (w/o inhibitors)
F-34	Turbine Fuel, Aviation, Kerosene + FSII (S-1745)	MIL-DTL-83133 Turbine Fuel, Aviation, Grade JP-8	---
F-35	Turbine Fuel, Aviation, Kerosene	MIL-DTL-83133 Turbine Fuel, Aviation, Grade JP-8	ASTM D 1655 Aviation Turbine Fuel, Jet A-1
F-44	Turbine Fuel, Aviation, High-Flash Type + FSII (S-1745)	MIL-DTL-5624 Turbine Fuel, Aviation, Grade JP-5	---
F-54	Diesel Fuel, Military	---	---
F-58	Kerosene	---	ASTM D 3699, 1-K
F-63	Diesel Fuel	DCSEA 108, Issue 1	---
F-65	Low-Temperature Diesel Fuel Blend	50/50 F-54 with F-34/F-35	---
--	--	A-A-52557 Fuel Oil, Diesel Grades DL-1 & DL-2	ASTM D 975 Diesel Fuel, Grades Low Sulfur 1-D & 2-D
F-75	Fuel, Naval Distillate, Low Pour Point	---	---
F-76	Fuel, Naval Distillate	MIL-F-16884 Fuel, Naval Distillate	---
S-1745	FSII, High Flash Point Type	MIL-I-85470 Inhibitor, Icing, Fuel System, High Flash	ASTM D 4171 FSII, Type III

*** Abbreviations:**

CEN	Comite Europeen de Normalisation
RON	Research Octane Number
FSII	Fuel System Icing Inhibitor
STANAG	Standardization Agreement
DL-	Diesel Fuel, Low Sulfur
A-A	Commercial Item Description Prefix

Explanation of Fuel Types

JP-4	MIL-DTL-5624's Grade JP-4 interchanged under NATO code number F-40; contains over 50 percent gasoline fractions; extremely volatile ; marginal to unsatisfactory cetane number quality.
JP-5	MIL-DTL-5624's Grade JP-5 interchanged under NATO code number F-44; contains only kerosene fractions; not considered volatile .
JP-8	MIL-DTL-83133 interchanged under NATO code number F-34; contains only kerosene fractions; not considered volatile. Identical to ASTM D 1655 Jet A-1, except Jet A-1 does not include fuel system icing inhibitor, corrosion inhibitor, or static dissipator additive, which are all mandatory under MIL-DTL-83133.
Jet A-1	Industry "standard" used worldwide by all commercial airlines. Has slightly lower freeze point requirement than Jet A (-47° vs. -40°C), interchanged under NATO code number F-35.
Jet A	Industry standard used only by U.S. commercial airlines when operating within the U.S.
F-54	A-A-52557 to be interchanged under NATO code number F-54; not considered volatile .

Selected Typical Fuel Properties (Average Survey Data)

Property	JP-4/Jet B	JP-5	JP-8	CONUS		OCONUS F-54
				DL-1	DL-2	
Gravity, °API	54.6	42.2	43.5	42.3	34.2	38.5
Density, lb/gal	6.306	6.826	6.652	6.779	7.111	6.930
K. Viscosity at 40°C, cSt	0.56	1.5	1.2	1.6	2.8	3.0
Cetane No.	23	42	45	44	47	49
Sulfur, % mass	0.037	0.047	0.049	0.02	0.02	N/A
Cloud Point, °C	-63	-46	-47	-41	-12	-19
Reid Vapor Pressure, at 38°C, psi	2.6	<1	<1	<1	<1	<1
Distillation, °C						
IBP	59	180	157	174	190	176
10% Rec.	91	191	175	196	222	219
50% Rec.	137	215	200	219	265	265
90% Rec.	197	242	236	246	313	311
Flash Point, °C	-20	63.3	48.9	50	74	70
Heat of Combustion						
Net BTU/lb	18,732	18,456	18,490	18,581	18,451	18,423
Net BTU/gal	118,124	125,270	123,069	125,207	131,207	127,820